

IN THE CLAIMS:

Please substitute the following claims for the previous claims.

1. (original) A substrate processing method comprising:
 - (a) providing a substrate in a process zone, the substrate comprising etch resistant material over an underlying material;
 - (b) removing the etch resistant material in the process zone; and
 - (c) after (b), providing an energized process gas in the process zone to etch the underlying material.

2. (original) A method according to claim 1 wherein (b) comprises providing an energized stripping gas in the process zone under process conditions selected to substantially remove a layer of etch resistant material.

3. (original) A method according to claim 2 wherein the energized stripping gas comprises an oxygen-containing gas.

4. (original) A method according to claim 3 wherein the energized stripping gas further comprises an oxygen activating gas.

5. (original) A method according to claim 4 wherein the oxygen activating gas comprises a nitrogen-containing gas.

6. (original) A method according to claim 1 wherein the substrate comprises at least two layers of etch resistant material and (b) comprises removing at least one of the layers of etch resistant material.

7. (original) A method according to claim 6 wherein at least one of the layers comprises mask material.

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8. (original) A method according to claim 7 further comprising providing an energized process gas to etch apertures in the mask material.

9. (original) A method according to claim 7 further comprising providing an energized process gas in the process zone to etch apertures in the mask material.

10. (original) A method according to claim 7 further comprising, before (b), providing an energized process gas in the process zone to etch apertures in the mask material.

11. (original) A method according to claim 1 wherein the layer underlying material comprises silicon and wherein the energized process gas comprises a halogen-containing gas.

Alt

12. (original) A method according to claim 11 wherein the energized process gas comprises one or more of CF_4 , C_2F_6 , NF_3 , SF_6 , Cl_2 , Br_2 , HBR, and HCl.

13. (original) A method according to claim 1 wherein the process zone is an energized gas zone in a process chamber.

14. (original) A substrate processing method comprising:

- (a) providing a substrate in a process zone, the substrate comprising a first and a second etch resistant material;
- (b) providing an energized process gas in the process zone to form apertures in the first etch resistant material; and
- (c) removing the second etch resistant material in the process zone.

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15. (original) A method according to claim 14 wherein the first etch resistant material comprises mask material.

16. (original) A method according to claim 14 wherein the second etch resistant material comprises photoresist.

17. (original) A method according to claim 14 wherein (b) comprises forming apertures in the first etch resistant material in accordance with a pattern of the second etch resistant material.

18. (original) A method according to claim 14 wherein (c) comprises providing an energized stripping gas in the process zone under process conditions selected to substantially remove the second etch resistant material.

19. (original) A method according to claim 18 wherein the energized stripping gas comprises an oxygen-containing gas.

20. (original) A method according to claim 14 wherein the substrate comprises a layer under the first and second etch resistant materials and further comprising providing an energized process gas to etch the layer.

21. (original) A method according to claim 14 wherein the substrate comprises a layer under the first and second etch resistant materials and further comprising providing an energized process gas in the process zone to etch the layer.

22. (original) A method according to claim 14 wherein the substrate comprises a layer under the first and second etch resistant materials and further comprising, after (c), providing an energized process gas in the process zone to etch the layer.

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23. (original) A method according to claim 22 wherein the layer comprises silicon and wherein the energized process gas comprises a halogen-containing gas.

24. (original) A method according to claim 23 wherein the energized process gas comprises one or more of CF_4 , C_2F_6 , NF_3 , SF_6 , Cl_2 , Br_2 , HBR, and HCl.

25. (original) A method according to claim 14 wherein the process zone is an energized gas zone in a process chamber.

26-33. (cancelled)

34. (original) A substrate processing method comprising:

(a) providing a substrate in a process chamber;
(b) providing an energized process gas in the chamber to process the substrate, thereby depositing process residue on surfaces of the process chamber;

(c) providing an energized process gas in the chamber to simultaneously remove a material from the substrate and at least partially remove the process residue from the surfaces of the process chamber; and

(d) after (c), providing an energized process gas in the chamber to further process the substrate.

35. (original) A method according to claim 34 wherein (b) comprises providing an energized process gas in the chamber to form apertures in a material on the substrate.

36. (original) A method according to claim 35 wherein (b) comprises forming apertures in a material comprising mask material.

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37. (original) A method according to claim 34 wherein (c) comprises removing etch resistant material from the substrate.

38. (original) A method according to claim 34 wherein (d) comprises etching a material on the substrate.

39-50. (cancelled)

51. (original) A substrate processing method comprising:

(a) providing a substrate in a process zone, the substrate comprising resist material over mask material;

(b) providing an energized process gas in the process zone to form apertures in the mask material;

(c) providing an energized process gas in the process zone to remove the resist material; and

(d) providing an energized process gas in the process zone to etch a layer under the mask material.

52. (original) A method according to claim 51 wherein (c) comprises providing an energized stripping gas in the process zone under process conditions selected to substantially remove a layer of resist material.

53. (original) A method according to claim 52 wherein the energized stripping gas comprises an oxygen-containing gas.

54. (original) A method according to claim 51 wherein the layer comprises silicon and wherein the energized process gas comprises a halogen-containing gas.

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55. (new) A substrate processing method comprising:

- (a) providing a substrate in a process zone, the substrate comprising a first etch resistant material, a second etch resistant material, and a silicon-containing layer that is under the first and second etch resistant materials;
- (b) providing a first energized process gas in the process zone to form apertures in the first etch resistant material;
- (c) removing the second etch resistant material in the process zone; and
- (d) providing a second energized process gas in the process zone to etch the silicon-containing layer, the second energized process gas comprising one or more of CF_4 , C_2F_6 , NF_3 , SF_6 , Cl_2 , Br_2 , HBR, and HCl.

56. (new) A substrate processing method comprising:

- (a) providing a substrate in a process zone, the substrate comprising a resist material over a mask material, the mask material being over an underlying material;
- (b) forming apertures in the mask material by providing a first energized process gas in the process zone;
- (c) removing the resist material from the substrate by providing an energized stripping gas in the process zone; and
- (d) after (c), providing a second energized process gas in the process zone to etch the underlying material.

57. (new) A method according to claim 56 wherein (b) comprises a first step of exposing the mask material to process gas substantially absent a polymer forming gas and a second step of exposing the mask material to process gas comprising a polymer forming gas.

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58. (n w) A method according to claim 57 wherein the first step comprises exposing the mask material to etchant gas comprising one or more of CF_4 , C_2F_6 , NF_3 , and SF_6 , and the second step comprises exposing the mask material to etchant gas comprising one or more of CHF_3 , CH_2F_2 , and CH_3F .

59. (new) A method according to claim 56 wherein (b) comprises providing a first energized process gas comprising one or more of HCl , BCl_3 , HBr , Br_2 , Cl_2 , CCl_4 , $SiCl_4$, SF_6 , F_2 , NF_3 , HF , CF_3 , CF_4 , CH_3F , CHF_3 , $C_2H_2F_2$, $C_2H_4F_6$, C_2F_6 , C_3F_8 , C_4F_8 , C_2HF_5 , C_4F_{10} , CF_2Cl_2 , and $CFCl_3$.

60. (new) A method according to claim 56 wherein (c) comprises providing an energized stripping gas comprising one or more of O_2 , N_2 , H_2O , NH_3 , CF_4 , C_2F_6 , CHF_3 , $C_3H_2F_6$, $C_2H_4F_2$, and CH_3F .

61. (new) A method according to claim 56 wherein (c) comprises providing an energized oxygen-containing stripping gas in the process zone under process conditions selected to substantially remove the resist material.

62. (new) A method according to claim 56 wherein (d) comprises providing a second energized process gas comprising one or more of CF_4 , C_2F_6 , NF_3 , SF_6 , Cl_2 , Br_2 , HBr , and HCl .

63. (new) A method according to claim 56 wherein (a) comprises providing a substrate in the process zone, the substrate comprising a resist material over a mask material, the mask material being over a silicon-containing material.

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64. (new) A method according to claim 56 wherein (a) comprises comprises providing a substrate in the process zone, the substrate comprising a resist material over a mask material, the mask material comprising one or more of silicon oxide, TEOS, and silicon nitride, and the mask material being over an underlying material.

65. (new) A substrate processing method comprising:

(a) providing a substrate in a process zone, the substrate comprising a photoresist material over a mask material, the mask material comprising one or more of silicon oxide, TEOS, and silicon nitride, and the mask material being over a silicon-containing underlying material;

(b) forming apertures in the mask material by providing an energized mask etching gas in the process zone;

(c) removing the photoresist material from the substrate by providing an energized stripping gas in the process zone; and

(d) after (c), providing an energized halogen-containing process gas in the process zone to etch the silicon-containing material.

66. (new) A method according to claim 65 wherein (b) comprises providing a first energized process gas comprising one or more of HCl, BCl_3 , HBr, Br_2 , Cl_2 , CCl_4 , SiCl_4 , SF_6 , F_2 , NF_3 , HF, CF_3 , CH_3F , CHF_3 , $\text{C}_2\text{H}_2\text{F}_2$, $\text{C}_2\text{H}_4\text{F}_6$, C_2F_6 , C_3F_8 , C_4F_8 , C_2HF_5 , C_4F_{10} , CF_2Cl_2 , and CFCl_3 .

67. (new) A method according to claim 65 wherein (c) comprises providing an energized stripping gas in the process zone, the stripping gas comprising one or more of O_2 , N_2 , H_2O , NH_3 , CF_4 , C_2F_6 , CHF_3 , $\text{C}_3\text{H}_2\text{F}_6$, $\text{C}_2\text{H}_4\text{F}_2$, and CH_3F .

68. (new) A method according to claim 65 wherein (c) comprises providing an energized oxygen-containing stripping gas in the process zone.

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69. (new) A method according to claim 65 wherein (d) comprises providing a second energized process gas comprising one or more of CF_4 , C_2F_6 , NF_3 , SF_6 , Cl_2 , Br_2 , HBR, and HCl.

70. (new) A substrate processing method comprising:

(a) providing a substrate in a process zone, the substrate comprising a resist material over a mask material, the mask material comprising one or more of silicon oxide, TEOS, and silicon nitride, and the mask material being over a silicon-containing material;

(b) forming apertures in the mask material by providing an energized mask etching gas in the process zone, the energized mask etching gas comprising one or more of the mask etching gas comprising one or more of HCl , BCl_3 , HBr , Br_2 , Cl_2 , CCl_4 , SiCl_4 , SF_6 , F_2 , NF_3 , HF , CF_3 , CF_4 , CH_3F , CHF_3 , $\text{C}_2\text{H}_2\text{F}_2$, $\text{C}_2\text{H}_4\text{F}_6$, C_2F_6 , C_3F_8 , C_4F_8 , C_2HF_5 , C_4F_{10} , CF_2Cl_2 , and CFCl_3 ;

(c) removing the resist material from the substrate by providing an energized stripping gas in the process zone, the stripping gas comprising one or more of O_2 , N_2 , H_2O , NH_3 , CF_4 , C_2F_6 , CHF_3 , $\text{C}_3\text{H}_2\text{F}_6$, $\text{C}_2\text{H}_4\text{F}_2$, and CH_3F ; and

(d) after (c), providing an energized process gas in the process zone to etch the silicon-containing material, the process gas comprising one or more of CF_4 , C_2F_6 , NF_3 , SF_6 , Cl_2 , Br_2 , HBR, and HCl.